Curriculum Vitae July 2011

Shu Fan

General Information

Current Position:	Senior Research Fellow (Level C)
Affiliation:	Department of Econometrics and Business Statistics, Monash University
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Research Interests

Energy system forecasting: Short-term and long-term electricity demand forecasting; Electricity price forecasting in day-ahead market and real-time market; Wind energy generation forecasting.

Energy system economics and management: Electricity market, power system schedule, demand response program.

Power system control and power electronics: Synchronous generator control, power system control for stability improvement. Variable frequency drive system and electronic power transformer.

Summary

Shu Fan received the B.S. degree in electrical machine and apparatus from Huazhong University of Science & Technology (HUST), Wuhan, China, in 1995. After graduated, he had been employed by Changzhou Transformer Company as a design engineer for two years. Then he obtained his M.S. and Ph.D. degrees in electrical engineering, from HUST, in 2000 and 2004, respectively. From 2004 to 2006, he was doing postdoctoral research work sponsored by Japanese Government in Osaka Sangyo University. From 2006 to 2007, he was a visiting assistant professor at the Energy Systems Research Center of The University of Texas at Arlington. Presently, he is a senior research fellow at Business and Economic Forecasting Unit, Department of Econometrics, Monash University. His research interests include energy system forecasting, electricity markets, demand response program, power system intelligent control, stability analysis, and power electronics. In the past years, he has published papers in the prestigious academic journals in the area of Electrical Engineering, including IEEE Transaction on Power Systems, IEEE Transaction on Industry Application, IEEE Transaction on Energy Conversion, Energy Conversion and Management, IET Generation, Transmission & Distribution, etc. He participated in research projects on generator excitation controller, medium voltage drive system and electronic power transformer when he was a Master and PhD candidate. He has been working on research projects and providing consulting advice in the energy system forecasting area for electric regulators and utilities in Australia and USA over the past 5 years. His methodology on short-term load forecasting and wind power generation forecasting has been adopted by Western Farmers Electric Cooperative in the United States, and the models on long-term density forecasting and short-term forecasting has been used by the Australian Energy Market Operator (AEMO) for regions in the National Electricity Market (NEM). As one of the recognized experts, he is invited as referees for top-tier journals of Electrical Engineering. He is a senior member of Institute of Electrical and member of Electronics Engineers (IEEE) and International Institute of Forecasters (IIF).

Education

Degree	Field	Name of University
Doctor 2000-2004	Electrical engineering	Huazhong University of Science & Technology
Master 1997-2000	Electrical engineering	Huazhong University of Science & Technology
Bachelor 1991-1995	Electrical Machinery and Apparatus	Huazhong University of Science & Technology

Professional Experience

Senior Research Fellow (Level C) 2009 -	The Business and Economic Forecasting Unit, Department of Econometrics and Business Statistics, Monash University, Australia
Research Fellow (Level B) 2008.1 – 2008.12	The Business and Economic Forecasting Unit, Department of Econometrics and Business Statistics, Monash University, Australia
Visiting Assistant Professor 2006.9 - 2007.12	Energy Systems Research Centre, University of Texas at Arlington, USA
Visiting Scholar 2006.6 - 2006.7	Department of Electrical Engineering, Tokyo Metropolitan University, Japan
Postdoctoral Scholar 2004.10 - 2006.7	Department of Electronics, Information, and Communication Engineering, Osaka Sangyo University, Japan
Engineer 1995-1997	Changzhou Transformer Company, China

Memberships in Professional Organizations

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, International Institute of Forecasters

Awards and Fellowships

"Dean's Award for Excellence in Innovation and External Collaboration" awarded by Faculty of Business and Economics, Monash University 2010

"Excellent doctor dissertation" awarded by Huazhong University of Science & Technology 2005

"Japanese Government Fellowship" awarded by Japanese Government (Monbukagakusho: MEST) 2004

"2rd Place Award of Edison Cup of Technology Innovation Competition" awarded by GE Foundation 2004

"Ten excellent graduate students of Huazhong University of Science & Technology" awarded by Huazhong University of Science & Technology 2004

Refereeing

I referee about 20 journal papers per year. Since 2005, I have refereed for the following journals.

- IEEE Transactions on Power Systems
- IEEE Transactions on Energy Conversions

- IEEE Transactions on Industry Applications
- IEEE Transactions on Neural Networks
- IET Generation, Transmission & Distribution (formerly IEE Proceedings)
- Information Sciences (Elsevier)
- Energy (Elsevier)
- Electric Power Systems Research (Elsevier)
- International Journal of Electrical Power and Energy Systems (Elsevier)
- International Journal of Forecasting
- International Journal of Power and Energy Conversion
- The Arabian Journal for Science and Engineering
- Applied Soft Computing
- European Transactions on Electrical Power

Selected Publications

A) books

1. J. Lu, C. Mao, **S. Fan**, D. Wang. Excitation Control of Synchronous Generator. *China Electric Power Press*, 2006, In Chinese
2. C. Mao, D. Wang, **S. Fan**, J. Lu. Electronic Power Transformer. *China Electric Power Press*, 2010, In Chinese

B) articles in refereed journals

3. **S. Fan** and R. J. Hyndman**,** "Short-term load forecasting based on a semi-parametric additive model", accepted by *IEEE Trans. Power Systems*, 2011
4. **S. Fan** and R. J. Hyndman**,** "The price elasticity of electricity demand in South Australia", *Energy Policy*, Vol. 39, pp. 3709-3719, 2011
5. R. J. Hyndman and **S. Fan,** "Density Forecasting for Long-term Peak Electricity Demand", *IEEE Trans. Power Systems*, Vol. 25, No.2, pp. 1142–1153, 2010
6. **S. Fan**, K. Methaprayoon, and W. J. Lee, "Multi-region Load Forecasting for System with Large Geographical Area", *IEEE Trans. Industry Applications*, Vol. 45, No. 4, pp. 1452-1459, 2009
7. **S. Fan**, L. Chen, W. J. Lee, "Short-term Load Forecasting Using Comprehensive Combination based on Multi- Meteorological Information," *IEEE Trans. Industry Applications*, Vol. 45, No. 4, pp. 1460-1466, 2009
8. **S. Fan**, J. Liao, R. Yokoyama, L. Chen, and W. J. Lee, "Forecasting the Wind Generation Using A Two-stage Network Based on Meteorological Information," *IEEE Trans. Energy Conversions*, Vol. 24, No. 2, pp. 474-482, 2009
9. **S. Fan**, L. Chen, W. J. Lee, "Machine Learning Based Switching Model for Electricity Load Forecasting," *Energy Conversion and Management*, Vol. 49, No. 6, pp. 1331-1344, 2008
10. **S. Fan**, C. Mao, L. Chen, "Next-Day Electricity Price Forecasting Using a Hybrid Network," *IET Generation, Transmission & Distribution (formerly IEE Proceedings)* Vol. 1, No. 1, pp. 176-182, 2007
11. D. Wang, C. Mao, J. Lu, **S. Fan**, F, Peng, "Theory and Application of Distribution Electronic Power Transformer," *Electric Power System Research*, Vol.77, No.2, pp. 219-226, 2007
12. **S. Fan**, C. Mao & L. Chen, "Electricity Peak Load Forecasting with Self-Organizing Map and Support Vector Regression," *IEEJ Transactions on Electrical and Electronic Engineering*, 2006, 1: 330-336.
13. **S. Fan**, L. Chen, "Short-Term Load Forecasting Based on an Adaptive Hybrid Method," *IEEE Trans. Power Systems*, Vol.21, No.1, pp.392-401, 2006
14. **S. Fan**, C. Mao, L. Chen, "Optimal coordinated PET and generator excitation control for power systems," *International Journal of Electrical Power & Energy Systems*, Vol. 28, No. 3, pp. 158-165, 2006
15. D. Wang, C. Mao, J. Lu, **S. Fan**, "Simulation research on imbalance loads of electronic power transformer in distribution system," *Electric Power*, Vol.38, No.11, pp. 21-26, 2005, In Chinese
16. D. Wang, C. Mao, **S. Fan**, H. Ma, "Design of Heat Sinking in High Voltage Variable Frequency Drive System," *Power Electronics*, Vol.39, No.2, pp.115-117, 2005, In Chinese
17. **S. Fan**, C. Mao, J. Lu, C. Zhang, "Neural Network Based Optimal Excitation Controller for Multi-machine Power System," *Proceedings of the CSEE* (Chinese Society for Electrical Engineering), Vol.24, No.7, pp.80-84, 2004, In Chinese

18. **S. Fan**, C. Mao, J. Lu, O. P. Malik, "Real-time Optimal Excitation Controller Using System Identification," *Australian Journal of Electrical & Electronics Engineering*, Vol.1, No.1, pp.7-13, 2004
19. Z. Hu, C. Mao, J. Lu, **S. Fan**, "Grey Excitation Controller for Synchronous Generator," *The Journal of Grey System*, Vol.16, No.1, pp51-58, 2004
20. **S. Fan**, C. Mao, J. Lu, "Real-time Excitation Controller Using Neural Networks," *Engineering Intelligent Systems*, Vol.11, No.3, pp.151-156, 2003
21. C. Mao, **S. Fan**, Y. Huang, J. Lu, "Theory of Power Electronic Transformer and Its Applications (II), *High Voltage Engineering*," Vol.29, No.12, pp.1-3, 2003, In Chinese
22. C. Mao, **S. Fan**, D. Wang, H. Fang, Y. Huang, "Theory of Power Electronic Transformer and Its Applications (I), *High Voltage Engineering*," Vol.29, No.10, pp.4-6, 2003, In Chinese

C) articles in conference proceedings

23. **S. Fan** and R. J. Hyndman, "Short-term Load Forecasting Based on Semi-parametric Additive Model," to be presented at *IEEE PES General Meeting* in Detroit, MI, USA, July 2011.
24. K. Zhang, J. Wu, C. Mao, J. Lu and **S. Fan**, "Low Voltage Ride Through Control Strategy of Directly Driven Wind Turbine with Energy Storage System," to be presented at *IEEE PES General Meeting* in Detroit, MI, USA, July 2011.
25. **S. Fan** and R. J. Hyndman, "Forecast Short-term Electricity Demand Using Semi-parametric Additive Model," *Proceedings of 20th Australasian University Power Engineering Conference* in Christchurch New Zealand, December 5-8, 2010.
26. **S. Fan**, J. R. Liao, W. J. Lee, "Multi-Region Load Forecasting for System with Large Geographical Area," *Proceedings of IAS Annual Conference* in Sheraton Sand Key Clearwater Beach, FL, USA. May 4-8, 2008.
27. **S. Fan**, L. Chen, W. J. Lee, "Short-term Load Forecasting Using Comprehensive Combination based on Multi- Meteorological Information," *Proceedings of IAS Annual Conference* in Sheraton Sand Key Clearwater Beach, FL, USA. May 4-8, 2008.
28. **S. Fan**, K. Methaprayoon, and W. J. Lee, "Short-term Multi-Region Load Forecasting Based on Weather and Load Diversity Analysis", *Proceedings of the 39th North American Power Symposium*, pp. 562-567, Las Cruces, NM, 2007.
29. **S. Fan**, J. Liao, K. Kaneko, and L. Chen, "An Integrated Machine Learning Model for Day-Ahead Electricity Price Forecasting," *Proceedings of IEEE PES Power System Conference and Exposition 2006*, pp.1643-1649, 27 Oct-1 Nov 2006, Atlanta, Georgia USA.
30. **S. Fan**, C. Mao, J. Zhang & L. Chen, "Forecasting Electricity Demand by a Hybrid Machine Learning Model," *Lecture Notes in Computer Science: Neural Information Processing-ICONIP 2006*, Springer, pp. 952-963, 2006.
31. L. Chen, **S. S. Fan** Fukutome, T. Wachi, Y. Makino, and G. Koshimizu, "Tracing Bidding Price in Electricity Market Based on Single Price Auction Model," *IEEE/PES T&D Conference & Exhibition: Asia Pacific*, Dalian, China, 2005
32. G. Li, C. Mao, J. Lu, Y. Wan, **S. Fan**, "Large Scale Synchronous Generator Control with High-Low Voltage Rectifier Bridges Excitation System," 2005 *IEEE/PES IEEE/PES T&D Conference & Exhibition: Asia Pacific*, Dalian, China, 2005
33. **S. Fan**, C. Mao, L. Chen, "Peak Load Forecasting Using the Self-Organizing Map," *Advances in Neural Networks-ISNN 2005*, Springer-Verlag Berlin Heidelberg, Part III, pp.640-649, 2005
34. D. Wang, C. Mao, J. Lu, **S. Fan**, "A Novel Power Quality Controller for Distribution Systems," *Proceedings of the International Conference on Electrical Machines and Systems*, Jeju Island, Korea, 2004.
35. **S. Fan**, C. Mao, J. Lu, W. Li, L. Chen, "Optimal Coordinated Generator Excitation and SMES Control for Transient Stability Improvement of Power System," *Proceedings of 38th International Universities Power Engineering Conference*, Thessaloniki, Greece, 2003, pp.329-332
36. D. Wang, C. Mao, J. Lu, **S. Fan**, X. Duan, "Design of snubber for series IGCTs used in high power and medium voltage converter", *Proceedings of 38th International Universities Power Engineering Conference, Thessaloniki*, Greece, 2003, pp. 157-180
37. **S. Fan**, C. Mao, J. Lu, L. Chen, "Stability control strategy of power system based on PET," *Proceedings of the 4th International Conference on Power Transmission & Distribution Technology*, Changsha, China, 2003, pp.564-569
38. J. Lu, D. Wang, C. Mao**, S. Fan**, "Study of RC-Snubber for series IGCTs," *Proceedings of International Conference on Power System Technology, PowerCon2002*, Kunming, China, Vol.1, pp.595-599

D) consulting reports

39. **S. Fan** and R. J. Hyndman (2010). "Forecasting long-term peak half-hourly electricity demand for South Australia". Report for Australian Energy Market Operator. Monash University Business and Economic Forecasting Unit.
40. Hyndman, R. J. and **S. Fan** (2010). "Forecasting long-term peak half-hourly electricity demand for Victoria". Report for Australian Energy Market Operator. Monash University Business and Economic Forecasting Unit.
41. Hyndman, R. J. and **S. Fan** (2010). "Modelling annual electricity demand for South Australia and Victoria". Report for Australian Energy Market Operator. Monash University Business and Economic Forecasting Unit.
42. **S. Fan** and R. J. Hyndman (2010). "Performance of short-term electricity demand model from 30 December 2009 to 20 January 2010". Report for Australian Energy Market Operator. Monash University Business and Economic Forecasting Unit.
43. Hyndman, R. J. and **S. Fan** (2009). "Modelling and forecasting short-term half-hourly electricity demand for South Australia and Victoria". Report for Australian Energy Market Operator. Monash University Business and Economic Forecasting Unit.
44. **S. Fan** and R. J. Hyndman (2009). "Forecasting long-term peak half-hourly electricity demand for distribution network of South Australia". Report for Australian Energy Market Operator (AEMO). Monash University Business and Economic Forecasting Unit.
45. R. J. Hyndman and **S. Fan** (2009). "Forecasting long-term peak half-hourly electricity demand for South Australia". Report for Electricity Supply Industry Planning Council (SA). Monash University Business and Economic Forecasting Unit.
46. R. J. Hyndman and **S. Fan** (2009). "Forecasting long-term peak half-hourly electricity demand for Victoria". Report for Victorian Energy Corporation (VenCorp). Monash University Business and Economic Forecasting Unit.
47. **S. Fan** and R. J. Hyndman (2008). "The price elasticity of electricity demand in South Australia and Victoria". Report for Electricity Supply Industry Planning Council (SA) and Victorian Energy Corporation (VenCorp). Monash University Business and Economic Forecasting Unit.
48. **S. Fan** and R. J. Hyndman (2008). "Modelling Victorian electricity demand using multiple and incomplete temperature sources". Report for Victorian Energy Corporation (VenCorp). Monash University Business and Economic Forecasting Unit.
49. R. J. Hyndman and **S. Fan** (2008). "Forecasting long-term peak half-hourly electricity demand for South Australia". Report for Electricity Supply Industry Planning Council (SA). Monash University Business and Economic Forecasting Unit.
50. R. J. Hyndman and **S. Fan** (2008). "Forecasting long-term peak half-hourly electricity demand for Victoria". Report for Victorian Energy Corporation (VenCorp). Monash University Business and Economic Forecasting Unit.
51. R. J. Hyndman and **S. Fan** (2008). "Modelling peak half-hourly electricity demand for Western Australia". Report for Western Power. Monash University Business and Economic Forecasting Unit.
52. R. J. Hyndman and **S. Fan** (2008). "Variations on seasonal bootstrapping for temperature simulation". Report for Electricity Supply Industry Planning Council (SA) and Victorian Energy Corporation (VenCorp). Monash University Business and Economic Forecasting Unit.

E) patents

53. C. Mao, **S. Fan**, H. Fang. Power Electronic Transformer. P.R. China, Invention Patent, Patent No.: ZL 02 1 39030.4
54. C. Mao, J. Lu, **S. Fan**, D. Wang. On-load Tap Changer Transformer with Smooth Voltage Regulation, Practical New Pattern Patent, Patent No.: ZL 2004 2 0017192.9

PhD thesis

55. **S. Fan**. "Study of Electronic Power Transformer and Medium Voltage Drive System". PhD thesis, Huazhong University of Science & Technology, 2004. In Chinese